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We claim:

1. Use of *Mycobacterium phlei* DNA (M-DNA) and a chemotherapeutic agent (M-DNA + chemotherapeutic agent) in the manufacture of a medicament to treat a cancer in an animal.
- 5 2. Use of M-DNA preserved and complexed on *Mycobacterium phlei* cell wall (MCC) and a chemotherapeutic agent (MCC + chemotherapeutic agent) in the manufacture of a medicament to treat a cancer in an animal.
3. The use according to claim 1 or 2, wherein the chemotherapeutic agent is selected from the group consisting of DNA cross-linking agents, DNA depolymerizing agents and
10 antimetabolic agents.
4. The use according to claim 1, 2, or 3 wherein the M-DNA + chemotherapeutic agent and MCC + chemotherapeutic agent induce cell cycle arrest in cells of the cancer.
5. The use according to claim 1, 2, or 3 wherein the M-DNA + chemotherapeutic agent and the MCC + chemotherapeutic agent inhibit proliferation of cells in the cancer.
- 15 6. The use according to claim 1, 2, or 3 wherein the M-DNA + chemotherapeutic agent and MCC + chemotherapeutic agent induces apoptosis in cells of the cancer.
7. The use according to anyone of claims 1-6, wherein the cancer is selected from the group consisting of leukemia, lymphoma and melanoma.
8. The use according to claim 7, wherein the cancer is melanoma.
- 20 9. Use of M-DNA in the manufacture of a medicament to induce cell cycle arrest in cancer cells in an animal.
10. Use of MCC in the manufacture of a medicament to induce cell cycle arrest in cancer cells in an animal.
11. The use according to claim 9 or 10, wherein the cell cycle arrest in the cancer cells
25 is induced at phase S/G2 of the cell cycle.
12. Use of M-DNA in the manufacture of a medicament to activate caspase activity in

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cancer cells in an animal.

13. Use of MCC in the manufacture of a medicament to activate caspase activity in cancer cells in an animal.

14. The use according to any one of claims 9, 10, 11, 12 or 13, wherein the cancer cells are melanoma cells.

15. Use of M-DNA for the manufacture of a medicament to treat melanoma in an animal having melanoma.

16. Use of MCC for the manufacture of a medicament to treat melanoma in an animal having melanoma.

10 17. A composition comprising M-DNA and a chemotherapeutic agent, wherein the M-DNA potentiates the anti-cancer activity of the chemotherapeutic agent in treating cancer in an animal having cancer.

15 18. A composition comprising MCC and a chemotherapeutic agent, wherein the MCC potentiates the anti-cancer activity of the chemotherapeutic agent in treating cancer in an animal having cancer.

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